

R E M A R K S

Claims 2 to 10 and 13 to 18 as set forth in the Listing of Claims attached to this paper are currently pending in this case. Claims 1, 11 and 12 have been canceled, Claims 2 to 10 have been amended, and Claims 13 to 18 have been added as indicated.

Applicants have rewritten Claim 1 as new Claim 13 to remove any confusion due to discrepancies between the marked up copy and the clean version submitted in the subsequent paper. Claims 2 to 10 have been revised accordingly. Additionally, applicants have deleted the expression "olefin" in favor of the wording --olefinically unsaturated compound-- in Claims 5 and 6. New Claim 14 is supported by original Claim 1 and relates to the process wherein the metal complex a1) is of formula (Ia). New Claims 15 to 18 have been added to further specify the miniemulsion referenced in subsection (e) of Claim 13 in accordance with applicants' disclosure on page 21, indicated lines 19 to 24, of the application. No new matter has been added.

Applicants herewith enclose a substitute copy of *WO 00/20464* (Tomov et al.) along with an English language translation thereof in light of the Examiner's indication that the copy originally submitted by applicants has become separated from the U.S. PTO's file. Consideration of the attached is solicited.

In light of applicants' cancellation of Claims 11 and 12 it is respectfully requested that the rejection of those claims under the provisions of Sections 101, 102(a), 102(b), 103(a) and 112, ¶1, be withdrawn.

It is further respectfully requested that the rejection of Claims 5 to 7 under the provisions of Section 112, ¶2, be withdrawn in light of the revision of the wording of Claims 5 and 6. Favorable action is solicited.

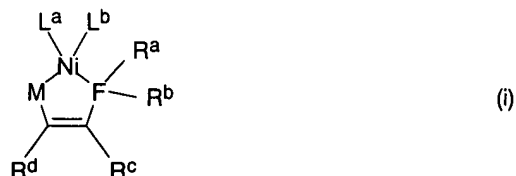
The Examiner has rejected Claims 1 to 10 (now: Claims 2 to 10 and 13 to 18) under 35 U.S.C. §112, ¶1, as failing to comply with the written description requirement. More particularly, the Examiner contends that the correction of formula (Ia) to indicate two groups R¹ bonded

to the ring member E introduces new matter for lack of specific support in the application as filed, and that the application therefore fails to reasonably convey to a person of ordinary skill in the art that applicants were in possession of the invention at the time the application was filed. Favorable reconsideration of the Examiner's position and withdrawal of the respective rejection is respectfully solicited in light of the following remarks.

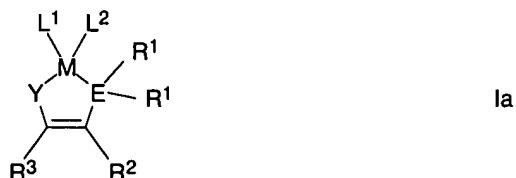
Applicants state, on page 14, indicated line 45, to page 15, indicated line 1, of the application as filed

The synthesis of the complexes of the general formula Ia and Ib is inherently known. Complexes of formula Ia are synthesized by analogy with the precepts in specifications EP-A 46331, EP-A 46328 and EP-A 52929.

A copy of **EP 46328** (Beach et al.) is of record and applicants herewith enclose a copy of **EP 46331** (Beach et al.) and a copy of **EP 52929** (Beach et al.). All of the references which are enumerated by applicants as illustrative of the preparation of the complexes represented by applicants' formula (Ia) relate to ylides generically represented by the following formula (i)¹⁾



in which F represents nitrogen, phosphorous, arsenic or antimony²⁾, and M denotes oxygen or sulfur³⁾. A comparison of the prior art ylides and applicants' formula (Ia)



in which E represents nitrogen, and Y denotes, inter alia, oxygen or sulfur, immediately reveals that the ring member E of applicants'

- 1) Compare page 3, second formula, of **EP 46328**, the formula on page 3 of **EP 46331**, and page 9, first formula, of **EP 52929**.
- 2) Compare page 4, indicated line 10, of **EP 46328**, page 4, line 4, of **EP 46331**, and page 9, indicated line 4, in conjunction with page 4, indicated lines 1 and 2, of **EP 52929**.
- 3) Compare page 4, indicated lines 8 and 9, of **EP 46328**, page 4, lines 1 and 2, of **EP 46331**, and page 9, indicated line 4, in conjunction with page 4, indicated line 1, of **EP 52929**.

formula (Ia) corresponds to the ring member F of the prior art ylides represented by formula (i). Accordingly, since applicants compounds of formula (Ia) are prepared in analogy to the prior art ylides represented by formula (i), applicants' compounds (Ia) have to carry two groups R^1 bonded to the ring member E. Moreover, since the compounds of applicants' formula (Ia) are obtained in the manner taught by the referenced art, the formation of the ylide structure comprising a ring member E which carries two groups R^1 is inherent.

In light of the foregoing, the cited section of applicants' disclosure not only provides specific support for the correction of applicants' formula (Ia) but also corroborates that applicants were, at the time the invention was filed, in possession of the invention as claimed.

It is also respectfully noted that applicants' Examples⁴⁾ refer, for the preparation of the complex according to the invention, to the teaching of *Bauers et al.*⁵⁾ which illustrates ylides corresponding to formula (i). A person of ordinary skill in the art who is, necessarily, aware of the contents of the pertinent references, would therefore immediately recognize that applicants' representation of formula (Ia) as originally filed was erroneous due to the lack of a second radical R^1 bonded to the ring member E. Accordingly, the correction in formula (Ia) does not go beyond the teaching which was inherently conveyed to a person of ordinary skill in the art by applicants' disclosure as originally filed. It is well settled that a change in the application does not introduce new matter which falls within the prohibitions of Sections 112, ¶1, and 132 where the invention which is originally described is not altered or changed⁶⁾. Since applicants' original description of the preparation of the compounds of formula (Ia) inherently results in structures wherein the ring member E carries two groups R^1 , the invention described in the original application is not changed by the correction of formula (Ia), and the correction of formula (Ia) does not introduce new matter which falls within the prohibitions of Sections 112, ¶1, and 132. Withdrawal of the Examiner's respective rejection is, therefore, respectfully solicited.

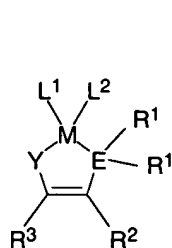
4) Page 30, indicated line 44 et seq., of the application.

5) *Macromolecules* 34, 1165-1171 (2001); of record.

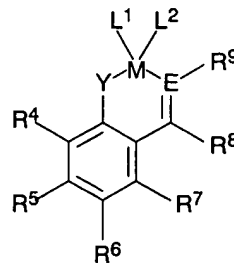
6) For example, *In re Oda*, 443 F.2d 1200, 170 USPQ 268 (CAFC 1971).

Additionally, the Examiner has rejected Claims 1 to 10 (now: Claims 2 to 10 and 13 to 18) under 35 U.S.C. §102(a) as being anticipated by or, alternatively, under 35 U.S.C. §103(a) as being rendered obvious by, the disclosure of *Kristen et al.* (WO 01/44325).

Kristen et al.'s disclosure relates to a method for the emulsion polymerization of olefins which is conducted in an aqueous dispersion in the presence of a catalyst of formula (ia) or (ib)



(ia)



(ib)

wherein at least one radical R^1 to R^3 and optionally one radical R^4 to R^9 contains a hydrophilic group X selected from $-\text{SO}_3^-$, $-\text{O}-\text{PO}_3^{2-}$, $\text{NH}(\text{R}^{15})_3^+$ and $-(\text{OCH}_2\text{CH}_2)_2\text{OH}^7$. In accordance with *Kristen et al.*'s method, the complex is employed in form of a solution in an organic solvent or in water, preferably dissolved in acetone and/or water⁸). The solution of the catalyst is, optionally in mixture with a solution of an emulsifier and/or with a solution of an activator, introduced into a stirred autoclave or loop reactor⁹). Subsequently, the monomer(s) is(are) added to the solution of the catalyst or the mixture of solutions¹⁰).

In contrast to the procedure taught by *Kristen et al.*, applicants' process requires

- that the metal complex is employed in form of a solution of the complex in the monomer(s) and/or an organic solvent having a low solubility in water (subsection (d) of Claim 13); and

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- 7) For example Abstract and page 1, indicated line 6, to page 3, indicated line 24, of WO 01/44325. The Examiner will note that neither formula (Ia) nor formula (Ib) of applicants' claims allows for the enumerated groups X of the referenced prior art.
 - 8) Page 28, indicated lines 18 et seq. and indicated line 39 et seq., of WO 01/44325. The representative examples additionally illustrate procedures where the catalyst complex is employed in form of a solution in toluol, for example Section 3.1.2, page 36, indicated line 38 et seq., in conjunction with Table 1, col. 5, on page 42 of WO 01/44325.
 - 9) Page 29, indicated line 45, to page 30, indicated line 3, of WO 01/44325.
 - 10) Page 30, indicated lines 5 to 11, of WO 01/44325.

- that the requisite solution is dispersed in the aqueous medium to a degree where the dispersed phase has an average droplet diameter of $\leq 1,000$ nm (subsection (e) of Claim 13), cf. a so-called "miniemulsion"¹¹⁾ is formed.

The teaching of *Kristen et al.* does not amount to a disclosure which anticipates applicants' process. To constitute an anticipating disclosure, a reference has to disclose all of the material elements which characterize the invention as claimed¹²⁾. The teaching of *Kristen et al.* does not disclose the formation of a "miniemulsion" as required in subsection (e) of Claim 13¹³⁾ and therefore does not show all of the material elements of applicants' process. Favorable reconsideration of the Examiner's position and withdrawal of the rejection under Section 102(a) based on the teaching of *Kristen et al.* is, therefore, respectfully solicited.

The teaching of *Kristen et al.* is also not deemed to amount to a teaching which renders applicants' invention as currently defined in Claims 2 to 10 and 13 to 18 prima facie obvious within the meaning of Section 103(a).

To establish prima facie obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success, and, finally, the prior art reference must teach or suggest all the claim limitations. Further, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and cannot be based on applicant's disclosure¹⁴⁾. Accordingly, the mere fact that a prior art reference can be modified in some manner so as to arrive at a claimed invention does not support a

11) For an explanation of the term "miniemulsion" and the expression "macroemulsion" please note page 20, indicated line 32, to page 21, indicated line 24, of the application.

12) ie. *In re Marshall* 577 F.2d 301, 198 USPQ 344 (CCPA 1978); *In re Kalm* 378 F.2d 959, 154 USPQ 10 (CCPA 1967)

13) The respective requirement is incorporated in the subject matter defined in Claims 2 to 10 and 14 to 18 by reference to Claim 13. The remarks are therefore equally applicable to the dependent claims.

14) *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (CAFC 1991)

conclusion of obviousness where the reference fails to suggest the desirability of the specific modification which is required¹⁵⁾.

The disclosure of *Kristen et al.* does not teach or suggest to conduct the polymerization in a manner where the the metal complex catalyst is dissolved in the organic phase and the organic solution of the catalyst is dispersed in the aqueous phase in form of a mini-emulsion, cf. an emulsion wherein a particularly low diameter of the organic phase droplets in the water phase is realized. As such, the disclosure of *Kristen et al.* fails to teach or suggest all of the limitations which characterize applicants' process and also fails to provide the suggestion or motivation which is necessary for a person of ordinary skill in the art to make the modification which is necessary to arrive at the claimed invention, and two out of the three basic criteria are not met.

Furthermore, with regard to metal complex catalysts corresponding to formula (ia), *Kristen et al.* teach that it is critical that at least one of the radicals R^1 to R^3 contains a specific hydrophilic group X which is selected from $-SO_3^-$, $-O-PO_3^{2-}$, $NH(R^{15})_3^+$ and $-(OCH_2CH_2)_2OH$. In light of the teaching of *Kristen et al.* a person of ordinary skill in the art could therefore not reasonably expect that metal complex catalysts corresponding to formula (ia) which lack the respective hydrophilic group could successfully be employed in an emulsion polymerization process conducted in aqueous dispersion. To the extent that applicants' process is conducted in the presence of a metal complex catalyst corresponding to applicants' formula (Ia) which does not allow for the presence of one of the specific hydrophilic group X of *Kristen et al.* the reasonable expectation of success is therefore not to be found in the prior art. Accordingly, to the extent that applicants claims relate to a process which is conducted in the presence of a metal complex catalyst corresponding to applicants' formula (Ia) none of the three basic criteria for establishing a prima facie case of obviousness is met.

In light of the foregoing it is respectfully requested that the rejection under Section 103(a) based on the teaching of *Kristen et al.* be withdrawn. Favorable action is solicited.

15) ie. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (CAFC 1984); see also, eg., Interconnect. Planning Corp. v. Feil, 774 F.2d 1132, 227 USPQ 543 (CAFC 1985)

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees, to Deposit Account No. 11.0345. Please credit any excess fees to such deposit account.

Respectfully submitted,

KEIL & WEINKAUF



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Encl.: THE LISTING OF CLAIMS (Appendix I)

Copy of **WO 00/20464** and English language translation thereof

Copy of **EP 046 331**

Copy of **EP 052 929**

HBK/BAS

A P P E N D I X I:

THE LISTING OF CLAIMS (version with markings):

1. (canceled)
2. (currently amended) [~~Process as claimed~~] The process defined in claim [±] 13, wherein the metal complex a1) is used in combination with an activator a2).
3. (currently amended) [~~Process as claimed~~] The process defined in claim [±] 13, wherein an electrically neutral nickel complex compound is used as the complex compound of the general formula Ia and/or Ib.
4. (currently amended) [~~Process as claimed~~] The process defined in claim 2, wherein the activator a2) is an olefin complex of rhodium or nickel.
5. (currently amended) [~~Process as claimed~~] The process defined in claim [±] 13, wherein ethylene is used exclusively as [~~olefin~~] olefinically unsaturated compound.
6. (currently amended) [~~Process as claimed~~] The process defined in claim [±] 13, wherein at least two [~~olefins~~] olefinically unsaturated compounds selected from the group [~~comprising~~] consisting of ethylene, propylene, 1-butene, 1-hexene and styrene are used.
7. (currently amended) [~~Process as claimed~~] The process defined in claim 6, wherein ethylene is used in combination with propylene, 1-butene, 1-hexene or styrene.
8. (currently amended) [~~Process as claimed~~] The process defined in claim [±] 13, where anionic, cationic and/or non-ionic emulsifiers are employed as the dispersing agents b).
9. (currently amended) [~~Process as claimed~~] The process defined in claim [±] 13, wherein aliphatic and aromatic hydrocarbons, fatty alcohols and/or fatty acid esters are used as the organic solvents c).
10. (currently amended) [~~Process as claimed~~] The process defined in claim [±] 13, wherein the portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water which contains the metal complexes a1) in solution and which is present in the aqueous medium as a

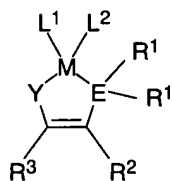
disperse phase having an average droplet diameter $\leq 1,000$ nm contains further components.

11. (canceled)

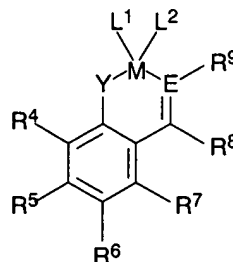
12. (canceled)

13. (new) A process for the production of an aqueous polymer dispersion which comprises reacting one or more olefinically unsaturated compounds in aqueous medium in the presence of

a) a complex compound of formula Ia and/or Ib



Ia



Ib

in which the substituents and indices have the following meaning:

M a transition metal of groups 7 to 10 of the periodic system of the elements,

L¹ phosphanes (R¹⁶)_xPH_{3-x} or amines (R¹⁶)_xNH_{3-x} having identical or different substituents R¹⁶, ethers (R¹⁶)₂O, H₂O, alcohols (R¹⁶)OH, pyridine, pyridine derivatives of the formula C₅H_{5-x}(R¹⁶)_xN, CO, C₁-C₁₂ alkyl nitriles, C₆-C₁₄ aryl nitriles or ethylenically unsaturated double-bonded systems, x standing for an integer between 0 and 3,

L² halide ions, amide ions (R¹⁶)_hNH_{2-h}, h standing for an integer between 0 and 2, and furthermore C₁-C₆-alkyl anions, allyl anions, benzyl anions or aryl anions,

wherein L¹ and L² can be linked to one another by means of one or more covalent bonds,

E nitrogen,

Y oxygen, sulfur, N-R¹⁰ or P-R¹⁰,

R¹ hydrogen, C₁-C₁₂-alkyl groups, C₇-C₁₃-aralkyl substituents or C₆-C₁₄ aryl groups,

R², R³ independently of one another hydrogen,

C₁-C₁₂ alkyl, wherein the alkyl groups can be branched or unbranched,

C₁-C₁₂ alkyl, singly or multiply substituted by identical or different C₁-C₁₂ alkyl groups, halogens, C₁-C₁₂ alkoxy groups or C₁-C₁₂ thioether groups,

C₇-C₁₃ aralkyl,

C₃-C₁₂ cycloalkyl,

C₃-C₁₂ cycloalkyl, singly or multiply substituted by identical or different C₁-C₁₂ alkyl groups, halogens, C₁-C₁₂ alkoxy groups or C₁-C₁₂ thioether groups,

C₆-C₁₄ aryl,

C₆-C₁₄ aryl, identically or differently substituted by one or more C₁-C₁₂ alkyl groups, halogens, singly or multiply halogenated C₁-C₁₂ alkyl groups, C₁-C₁₂ alkoxy groups, silyloxy groups OSiR¹¹R¹²R¹³, amino groups NR¹⁴R¹⁵ or C₁-C₁₂ thioether groups,

C₁-C₁₂ alkoxy groups,

silyloxy groups OSiR¹¹R¹²R¹³,

halogens or

amino groups NR¹⁴R¹⁵

wherein the substituents R² and R³ can form a saturated or unsaturated 5- to 8-membered ring with one another,

R⁴ to R⁷ independently of one another

hydrogen,

C₁-C₁₂ alkyl, wherein the alkyl groups can be branched or unbranched,

C₁-C₁₂ alkyl, singly or multiply substituted by identical or different C₁-C₁₂ alkyl groups, halogens, C₁-C₁₂ alkoxy groups or C₁-C₁₂ thioether groups,

C₇-C₁₃ aralkyl,

C₃-C₁₂ cycloalkyl,

C₃-C₁₂ cycloalkyl, singly or multiply substituted by identical or different C₁-C₁₂ alkyl groups, halogens, C₁-C₁₂ alkoxy groups or C₁-C₁₂ thioether groups,

C₆-C₁₄ aryl,

C₆-C₁₄ aryl, identically or differently substituted by one or more C₁-C₁₂ alkyl groups, halogens, singly or multiply halogenated C₁-C₁₂ alkyl groups, C₁-C₁₂ alkoxy

groups, silyloxy groups $\text{OSiR}^{11}\text{R}^{12}\text{R}^{13}$, amino groups $\text{NR}^{14}\text{R}^{15}$ or $\text{C}_1\text{-C}_{12}$ thioether groups,
 $\text{C}_1\text{-C}_{12}$ alkoxy groups,
silyloxy groups $\text{OSiR}^{11}\text{R}^{12}\text{R}^{13}$,
halogens
 NO_2 groups or
amino groups $\text{NR}^{14}\text{R}^{15}$,

wherein pairs of neighboring substituents R^4 to R^7 can form a saturated or unsaturated 5- to 8-membered ring with one another,

R^8 , R^9 independently of one another

hydrogen, $\text{C}_1\text{-C}_6$ alkyl groups, $\text{C}_7\text{-C}_{13}$ aralkyl substituents or

$\text{C}_6\text{-C}_{14}$ aryl groups, optionally substituted by one or more $\text{C}_1\text{-C}_{12}$ alkyl groups, halogens, singly or multiply halogenated $\text{C}_1\text{-C}_{12}$ alkyl, $\text{C}_1\text{-C}_{12}$ alkoxy groups, silyloxy groups $\text{OSiR}^{11}\text{R}^{12}\text{R}^{13}$, amino groups $\text{NR}^{14}\text{R}^{15}$ or $\text{C}_1\text{-C}_{12}$ thioether groups,

R^{10} to R^{15} independently of one another

hydrogen,

$\text{C}_1\text{-C}_{20}$ alkyl groups, which on their part may be substituted by $\text{O}(\text{C}_1\text{-C}_6 \text{ alkyl})$ or $\text{N}(\text{C}_1\text{-C}_6 \text{ alkyl})_2$ groups,

$\text{C}_3\text{-C}_{12}$ cycloalkyl groups,

$\text{C}_7\text{-C}_{13}$ aralkyl substituents or $\text{C}_6\text{-C}_{14}$ aryl groups

R^{16} hydrogen

$\text{C}_1\text{-C}_{20}$ alkyl groups, which for their part may be substituted by $\text{O}(\text{C}_1\text{-C}_6 \text{ alkyl})$ or $\text{N}(\text{C}_1\text{-C}_6 \text{ alkyl})_2$ groups,

$\text{C}_3\text{-C}_{12}$ cycloalkyl groups,

$\text{C}_7\text{-C}_{13}$ aralkyl substituents or $\text{C}_6\text{-C}_{14}$ aryl groups

- b) dispersing agents and optionally
- c) organic solvents having low solubility in water,
- d) the metal complexes a) being dissolved in a portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water and
- e) the portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low

solubility in water which holds the metal complexes a1) in solution being present in the aqueous medium as a dispersed phase having an average droplet diameter $\leq 1,000$ nm.

14. (new) The process defined in claim 13, wherein the metal complex a1) is of formula (Ia).
15. (new) The process defined in claim 13, wherein the average droplet diameter of the disperse phase in (e) is ≤ 700 nm.
16. (new) The process defined in claim 15, wherein the average droplet diameter of the disperse phase in (e) is ≥ 40 nm.
17. (new) The process defined in claim 13, wherein the average droplet diameter of the disperse phase in (e) is ≤ 500 nm.
18. (new) The process defined in claim 13, wherein the average droplet diameter of the disperse phase in (e) is from 100 to 400 nm.